



# Toronto Fire Services Analytics and Decision Support

## USE OF DATA CASE STUDY

### The Opportunity

As the largest fire department in Canada and one of the largest in North America, when Toronto Fire Services developed its “TFS Transformation Plan . . . the organization [realized it] was data rich [but] needed capacity to analyze the data and help to tell the story behind the data” and needed “to present the measures in a user-friendly way.”

### The Action

Toronto Fire Services developed key performance initiatives and formed a new division – Analytics and Decision Support – with staff assigned to “deliver timely insightful information while also promoting the use of analytic capabilities throughout the organization.”

### The Outcome

The department and its Analytics and Decision Support Division continue to push further toward data and risk-based decision-making across all levels of the organization and across all divisions.

#### DEPARTMENT INFO

TORONTO FIRE SERVICES

POPULATION SERVED: 2.98M

TOTAL PERSONNEL: 3192

STATIONS: 84

GOVERNANCE: MAYOR, CITY COUNCIL

EMS SERVICE: BASIC LIFE SUPPORT

ANNUAL BUDGET: \$502.7M (CDN)

## Introduction

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If you don't know, Harvard Business School and MIT's Sloan School of Management certainly do – data can tell a compelling story. In-person and online courses abound across this landscape, pitching a marketing angle related to the use of data. Enroll in a certificate program, take courses such as “Communicating Clearly and with Reason” and in six weeks or six months you can develop skills that will help you harness data to communicate a message. When Toronto Fire Services found itself at the intersection of needing to tell its story differently and integrate a continuous improvement mindset, it realized it first needed a place to “do this work.”

## The Opportunity

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In 2017, Toronto Fire Services began implementing a comprehensive Transformation Plan which prioritized the objectives and strategic direction of its 2015-2019 Master Fire Plan. In looking to make significant steps toward continuous improvement and fire service accreditation, the organization realized that while they generated massive amounts of data, there were significant issues with data capture, analysis, and how these data were presented, both within the organization and outside to elected officials and the public.

While there are technology improvements and processes that might have expedited changes, the organization first created a new division whose focus would be to manage the shift toward more effective data capture, management, and analysis. Moving eight existing staff from its Technology Division to a newly formed Analytics and Decision Support Division was an important step toward fulfilling this mandate.

## The Action

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The division had the backing of Toronto Fire Services' leadership team to use new ideas and processes, which would potentially impact the organization as a whole, and had a formal mandate to “enable fact-based performance management and decision-making through the use of state-of-the-art analytics and quality data.”

In addition to support from the department's leadership there were several early objectives that provided an initial foundation to the new division:

- Negotiate a memorandum of understanding with the department's labour group
- Identify staff roles and skill sets through a “division design” process
- Acquire needed software
- Establish and implement a change management process

- Understand capabilities, dashboards, key performance indicators across all the department's divisions
- Develop a 3-phase business intelligence architecture:
  - Strategy phase (what does the department want the division "to be?")
  - Transformation phase (implementation of critical success recommendations)
  - Adoption of continuous improvement practices

Within the division itself, staff established a stricter timeline for fulfilling internal and external information requests, committed to providing operations insights for managing performance, and providing strategic and tactical analysis for assisting management decision-making.

What this meant in practice was "piloting" changes:

- Adopting fire service and TFS-specific key performance measures (what should the department report out on an annual basis, what does it mean, and what actions should result?).
- Developing a glossary of terms (common terminology when rolling out different initiatives)
- Identifying a total number of analytics needs for budget submission development
- Determining the total number of queries/requests made (expected and historical)
- Assessing current data analysis needs by division – operational, fire prevention, public education – Initially this was about outputs (delivering data for use) as opposed to creating positive outcomes.
- Asking broad questions, such as: what open-source or publicly available data can be used/harnessed by the department?

## **The Outcome**

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The division worked to overcome inherent fire service skepticism toward analytics-informed change, realizing that while it had the backing of the department's leadership, it needed to establish its relevance to the supporting of the department's mission.

Timing is everything: around the same time as the division's creation, the department was facing significant budget pressure and the risk of frontline staffing reductions. It was imperative that the department be able to accurately determine the impact of potential service level reductions, in order to enable Council to make informed decisions. By using data modeling and analytics to forecast the impacts associated with potential service level reductions, the Analytics and Decision Support Division developed comprehensive impact assessments for each of the potential service level reductions to emergency response time performance on both a City-wide and Ward level.

# TORONTO FIRE SERVICES - ANALYTICS AND DECISION SUPPORT

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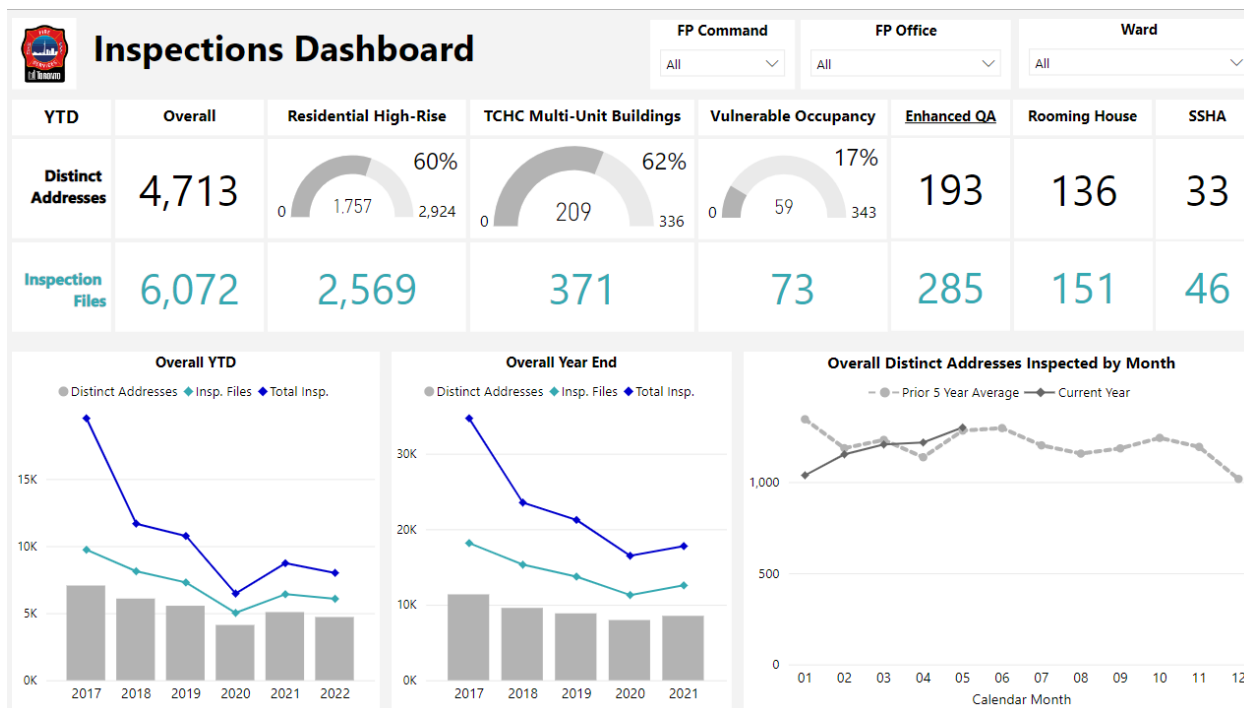
On an ongoing basis, the TFS Management Team monitors service volume, performance, and reliability measures, on a daily, weekly, and monthly basis, to inform opportunities for tactical deployment adjustments that enable service level optimization across the service.

Figure 1 Part of Daily Operations Service Report (as of June 20, 2022)

Service Volume and Service Level	2022-06-20	YTD Daily Avg	Prior YTD Avg	YTD Avg Variance
Emergency Event Count	428	438	336	↑ 102
Emergency Unit Runs	679	720	608	↑ 111
% Events Met First-In Target 6:24	78.2%	75.2%	78.0%	↓ -2.7%
% Events Met EFF Target 10:24	93.2%	89.6%	88.2%	↑ 1.4%

In support of risk reduction strategies, TFS combined multiple data sets to create a building stock repository that was used in the 2022 Community Risk Assessment and for calculating “probabilities of harm” for a variety of occupancy and building types. Fire Prevention uses building stock data to set inspection targets for high hazard and vulnerable occupancies.

Figure 2 TFS Analytics Portal Inspection Dashboard for tracking progress against inspection targets (as of June 21, 2022)

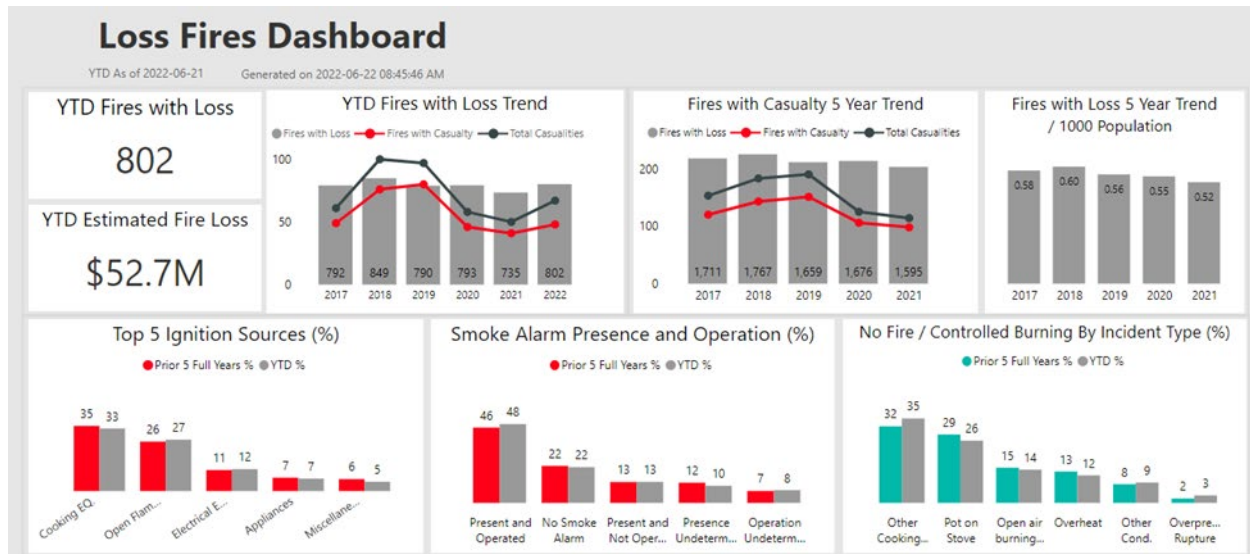


## TORONTO FIRE SERVICES - ANALYTICS AND DECISION SUPPORT

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To design fire safety messaging that will resonate and have an impact, TFS examines actual fire loss trend data, building stock as well as local demographic data. The result is campaigns such as the “Don’t Be A Flicking Idiot” campaign that gained international attention: <https://www.toronto.ca/community-people/public-safety-alerts/safety-tips-prevention/home-high-rise-school-workplace-safety/smoking-safety/>

Figure 3 TFS Fire Loss Dashboard used for trend analysis (as of June 21, 2022)



The Analytics and Decision Support Division has led the department’s push toward greater fact and risk-based decision-making. This has meant working through complex, identified issues within defined project parameters – put differently, it’s not just creating real-time intelligence dashboards, but creating real change through the consistent use of data.

TFS is transparent about several challenges it’s faced since the creation of the Analytics and Decision Support Division:

- As the division moved the department toward self-service options for data and information, it has needed to ensure that staff understands this new process for requests and access to information.
- While the division had support from the department’s leadership, the division has needed to ensure staff through the organization can provide ongoing feedback. Related to the first point above, the division has recognized the need for training for stakeholders/staff when there is a process change that impacts the department as a whole or one of its divisions.
- The division’s staff must ensure its understanding of the department as a whole and has recognized that its needs to spend time in the field shadowing fire operations, inspections, investigations, communications, and training to enable increasingly-informed analytics operations.

## Tips for Replication

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As a large, complex metro fire department, Toronto Fire Services' first step toward continuous improvement and the integrated use of data in its decision-making was the creation of a dedicated division to support these efforts. The department readily shares key features of its process and recommends that departments:

- *Conduct an initial assessment:* Use a strengths, weaknesses, opportunities, and threats analysis (SWOT) to set a baseline of current ability and capability.
- *Ensure senior leadership is involved:* When developing key performance measures work with key staff during development (preferable), or (at a minimum) ensure these staff are educated/knowledgeable of those measures which will affect their service areas.
- *Develop a department-driven data governance strategy:* This may mean working with your city/county information technology staff to ensure that as your department moves forward, it complies with requirements.
- *Identify staff needs:* Work with city resources to help fill in the gap of any technical skill sets.
- *Start slowly, building relevance and trust:* Build on early successes to achieve greater sustainability.

## About CPSE and Metro

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[www.cpse.org](http://www.cpse.org)



The Metropolitan Fire Chiefs Association brings fire service professionals together to address the challenges of large-jurisdiction departments across the globe serving as an educational resource and promoting best practices for members to follow.

[www.nfpa.org/metro](http://www.nfpa.org/metro)

CPSE and Metro have partnered to develop this series highlighting proven practices of Metro departments accredited by CPSE's Commission on Fire Accreditation International.